By way of the amendment instructions above, claim 20 has been revised substantively so as to include the subject matter of claim 21. As such, claim 21 has been cancelled.

All pending claims have been further revised for purpose of clarity and to improve claim syntax. Moreover, claims 26-28 are new and include subject matter recited in alternative expressions in prior claims 23 and 25 and from which such new claims depend.

Accordingly, claims 20 and 22-28 are pending herein for which favorable reconsideration on the merits is requested.

The only issue remaining to be resolved in this application are the Examiner's art-based rejections. Specifically, prior claims 20-21 have been rejected under 35 USC §103(a) as allegedly unpatentable based on Laakso in view of Reinhall '444 with or without Gervasi. White et al has been combined with the references applied against claims 20-21 so as to reject original claims 22-24 under 35 USC §103(a), while original claim 25 has been rejected under this same statutory provision with the further addition of Reinhall '221 reference. Applicants suggest that none of the applied patents is appropriate as a reference against the claims pending herein.

In this regard, applicants note that Laakso discloses a system to presteam and deaerate chips. The deaeration means comprises a horizontally extending vessel 12, having a horizontal axis, and a rotatable screw extending along the axis. Steamed chips entrained in liquid are fed into the horizontal vessel at one end thereof, and deaerated chips are removed from the vessel at the other end thereof. Liquid circulation loops are provided at both the inlet to, and the outlet from, the horizontal vessel. At a central portion of the vessel, deaerated liquid is continuously circulated into contact with material passing in the vessel. Screens which are parallel to the axis of the vessel are part of the system for providing for the flow of deaerated liquid. A closed recirculatory loop of such liquid is provided, and a liquid and air separator is provided in that loop to effect deaeration of the liquid flowing therein.

Laakso does not disclose or suggest at all a thickener apparatus for pulp. In the Laakso system, the chips are deaerated while being conveyed, and mechanically agitated, by the screw 69. This function is accomplished hydraulically, utilizing the header 76, and bottom and top screens 77, 78. The screens 77 and 78 are parallel to the axis 68. Preferably each of the screens 77, 78 is arcuate and covers approximately one-quarter the circumference of the path of chips flowing generally horizontally through the vessel 12. The consistency does not change when the material flows in vessel 12 because there is a closed loop (80, 81, 82, 79) of a deaerated liquid. The deaerated liquid is introduced by conduit 79 into the bottom of the header 76, passes upwardly through the screens 77, 78 generally transverse to the axis 68, and passes out the top of the vessel 12 under the influence of pump 80. The liquid passing through the chips removes air from the chips and replaces it with liquid. The heated, deaerated chips are discharged from the vessel 12 through chute 73 in the low pressure loop of the high-pressure feeder 14, and are transferred under the influence of the high pressure pump 85 to the top of the digester.

Significantly, therefore, in the Laakso apparatus, filtrate is ***not*** removed from the chips. Thus, Laakso does not suggest or disclose in any way an apparatus even arguably functionally similar to the present invention whereby filtrate is removed from pulp so that the pulp will be thickened.

The Examiner refers applies Reinhall '444 against the pending claims herein. Reinhall , however, discloses a dewatering apparatus for fiber pulp. The dewatering apparatus of Reinhall is in the form of a relatively long vertical container 14 provided with inlet and outlet means for the suspension and a stirrer driven by an electric motor. Separate sets of perforations 24 are provided in the wall of the container, each set of perforations communicating with a compartment 64 located externally of the container for drainage of water pressed out of the fiber pulp suspension in the container. The compartments communicate through separate one-way valves 68 with a common discharge conduit provided with a control valve 32. The pressure in the compartments is regulated but maintained lower than in the container to control drainage of water

pressed out of the fiber pulp suspensions through the perforations. The suspension is preferably introduced under superatmospheric pressure into the container such as by means of a pump. The pulp is fed to the dewatering apparatus by means of pump 48 through a conduit 50 and valve 52. The pulp feed is controlled by pump 48. The dewatered pulp passes from the outlet of the dewatering apparatus into the inlet of a grinding machine by means of a screw conveyor 54.

The Reinhall '444 apparatus thus has a valve in the pulp feeding line and several valves (68, 32) in the filtrate discharge line. The filtrate valve 32 is used to control the filtrate flow. Significantly, there is no valve in the pulp discharge, but instead the pulp discharge opens out directly to screw conveyer 54.

The Examiner asserts that Reinhall '444 teaches that the pulp material and filtrate exiting the vessel can be controlled by valves 50 and 34. Applicants respectfully cannot locate any valves having such reference numbers in the Reinhall document. Assuming the Examiner meant to refer to valves 60 and 32, applicants note that valve 60 is in the outlet line of the grinding machine and it is in no way a control valve by means of which the operation of the dewatering apparatus can be controlled.

The Examiner argues that the applicants' invention is unpatentable because it would have been obvious that the material into and out of the dewatering vessel of Laakso could have been controlled using valves taught by Reinhall '444. As it is already stated, the Laakso apparatus cannot in any way be considered a dewatering apparatus, but instead is a deaerator. Furthermore, the flows of the Laakso system are controlled by pumps – ***not*** valves. There is no need for any valves in Laakso system. In the applicants' opinion, it is not at all "obvious" to combine the teachings of Reinhall '444 with Laakso as the result would be a non-operable device. The deaerator of Laakso performs its task in the manner it is designed to operate, and new ways of using the valves cannot be incorporated in Laakso without defective results. [2]

[2] It is clearly improper (and hence evidence of *un*obviousness) to advance a combination of references where, like here, such a combination of references would destroy the structure of the

In the Laakso apparatus, the chips are conveyed and mechanically agitated by means of the screw 69. The chips are collected on the internal wall of the screen only to some extent, because there is no such pressure difference over the screen surface. Laakso does not teach that there would be any material collecting on the screen surface which should be removed. It is enough when the chips entrained in liquid are mixed which also improves deaeration.

Turning attention to the applied Gervasi reference, applicants note that the filter of Gervasi operates in such a manner that liquid with turbid particles is fed from above into the filter, and the filter cake is allowed to form on the precoat layer of the filter surface. The worm rotates slowly in close proximity to the filter surface and scrapes off the filter cake from the precoat layer. The filtered material is collected in the conical bottom portion of the device wherefrom the filtered material is removed via gate valve and suction pump only when the conical part is filled with such material (column 4, lines 48 through 58).

In fact, it should be understood that the true operation of the filter discussed in Gervaisi is such that in the beginning of the operation cycle the entire device is filled with the liquid to be cleared. The filtering proceeds in such a manner that clear liquid is filtered through the filter surface and the filter cake is scraped down into the bottom cone. In other words, the filter cake as heavier material displaces the liquid from the bottom cone and gradually fills the bottom while new liquid is introduced into the device. The operation is continued until the bottom cone is filled whereafter the operation is shut down and the cone emptied.

Again, there is clearly no suggestion of impetus provided to the ordinarily skilled person to combine Gervasi with Laakso, because the purpose of the respective apparatus is so vastly different – namely, one is a filter, while the other a deaerator. Hence, even if it is assumed for the moment that Gervasi might somehow be combined with Laakso and Reinhall '444, the present invention would not result.

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reference for its intended purpose. *See. Ex party Thompson*. 184 USPQ 558 (Bd. of Appeals 1974). *Ex parte Hartmann*. 186. USPQ 366 (Bd. of Appeals 1974).

White et al and Reinhall '221 fail to cure the glaring deficiencies noted above with respect to Laakso, Reinhall '444 and Gervasi. As such, their combination with such references cannot possibly render obvious the subject matter of claims 22-24.

In view of the amendments and remarks presented herewith, applicants suggest that this application is in condition for prompt allowance, and Official Notice to that effect is solicited.

Respectfully submitted,

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APPENDIX I

Marked-Up Version of Amended Claims Pursuant to 37 CFR §1.121(c)

20. (Twice Amended) An apparatus for treating pulp, which apparatus comprises:

an essentially elongated outer casing having [the] first and second ends [; of] which [is] are closed with [an] first and second end plates, respectively;

an inlet conduit, P_{in}, at [the] said first end of [which] said outer casing [there is arranged an inlet conduit] for introducing a [the] fiber suspension to be treated into the apparatus; [P_{in}; the other end of which casing is closed with an end plate; at said other end of which casing there is arranged]

a fiber suspension discharge conduit, P_{out}, at said second end of said outer casing for discharging [the] a thickened fiber suspension [P_{out} being discharged] from the apparatus; and [which casing is provided with]

a filtrate discharge conduit, F_{out}, provided in said outer casing for the filtrate [F_{out}]; wherein [inside which casing]

essentially at least between the inlet conduit and the fiber suspension discharge conduit the apparatus includes, [there is arranged]

(i) a filter surface having a [preferably] substantially round cross section, and [arranged inside it]

(ii) a cleaning member positioned inside said filter surface, said cleaning member comprising a rotating shaft, [on which shaft] and at least one screw thread [is] fixed to said rotating shaft for keeping the filter surface clean, and wherein [characterized in that]

the fiber suspension and filtrate discharge conduits for the thickened pulp and the filtrate, respectively, are provided with valves for controlling the operation of the [pre-thickener] apparatus, and wherein said valves are controlled in response to input power to the shaft, on the basis of an impulse from a previous process stage or a pressure difference prevailing over the filter surface.

Please cancel claim 21.

22. (Twice Amended) An apparatus according to claim 20, [characterized in that] wherein the screw thread is fixed on the shaft by means of tie rods which leave a free space between the shaft and the screw thread.

23. (Twice Amended) An apparatus according to claim 22, [characterized in that] wherein a [the] clearance [of] between the screw thread [from] and the filter surface is less than 5 mm.

24. (Twice Amended) An apparatus according to claim 23, wherein [22, characterized in that] the clearance between [of] the screw thread [from] and the filter surface is less than 3 mm [and suitably 0.2 – 2 mm].

25. (Twice Amended) An apparatus according to claim 22, wherein [characterized in that] the [screening] filter surface is provided with [essentially axial grooves or corresponding] guides which prevent the fiber [mat] suspension from rotating inside the filter surface.